

Claims

5 1. An exothermic device for topically delivering an active agent, said device comprising:

(a) a liquid reservoir, said reservoir comprising water;

(b) a heating element, said heating element comprising an oxidizable material and where said heating element is in communication with said liquid reservoir;

(c) an oxygen-permeable outer-layer, wherein said oxygen-permeable layer is in communication with said heating element, permits oxygen from the environment to contact said heating element, and substantially inhibits the permeation of water from the heating element into the environment;

(d) an active agent; and

(e) a water-impermeable layer, wherein said water-impermeable layer separates said heating element and said active agent;

20 wherein upon the rupturing of said liquid reservoir, said water contacts said heating element and said oxygen to create an exothermic reaction.

25 2. A device of claim 1, wherein said liquid reservoir is contained between said oxygen-permeable layer and said water-impermeable layer. ✓

3. A device of claim 1, wherein said device further comprises an adhesive layer, said adhesive layer

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comprising an adhesive for affixing said device to the skin of the user.

4. A device of claim 3, wherein said device further comprises a removable liner affixed to said adhesive layer.

5. A device of claim 3, wherein said adhesive layer comprises said active agent.

6. A device of claim 1, wherein said liquid reservoir further comprises a salt, said salt selected from the group consisting of NaCl, KCl, CaCl₂, FeCl₃, FeCl₂, MgCl₂, AlCl₃, Na₂SO₄, K₂SO₄, Fe(SO₄)₃, FeSO₄, or MgSO₄.

7. A device of claim 1, wherein said heating element further comprises a salt, said salt selected from the group consisting of NaCl, KCl, CaCl₂, FeCl₃, FeCl₂, MgCl₂, AlCl₃, Na₂SO₄, K₂SO₄, Fe(SO₄)₃, FeSO₄, or MgSO₄.

8. A device of claim 1, wherein said oxidizable material comprises carbon and metal powder, said metal powder selected from the group consisting of iron, aluminum, magnesium, zinc, and a mixture thereof.

9. A device of claim 1, wherein said oxidizable material comprises carbon and an inorganic powder, said

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inorganic powder selected from the group consisting of ferrosiferrous oxide, plumbobimberic oxide, trimanganese tetroxide, black copper oxide and manganese dioxide.

5 10. A device of claim 1, wherein said heating element is contained within a water-permeable membrane.

11. A device of claim 1, wherein said heating element further comprises a polymer.

12. A device of claim 1, wherein said active agent is for the treatment of acne. 153

13. A device of claim 1, wherein said oxygen-permeable layer is an open-cell foam. } ✓

14. A device of claim 1, wherein said device further comprises a removable oxygen-impermeable cover sheet affixed to said oxygen-permeable layer. ✓

15. A device of claim 1, wherein said device comprises a plurality of liquid reservoirs. ✓

16. A device of claim 1, wherein said exothermic reaction is between about 40° C and 42° C. ✓

17. A method of topically delivering an active agent to a mammal, said method comprising attaching the device of claim 1 to a barrier membrane of said mammal.

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20. A method of claim 18, wherein said device is attached a mucosal layer of said human.

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